

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

Please amend the claims such that they read as follows:

Claim 1 (currently amended): A method for obtaining apomictic plants from sexual plants comprising:

F₃ (a) obtaining ~~at least~~ two sets of diploid delineated sexual lines from ~~a~~ an angiospermous plant species, genus, or family, or group of related plant species that are differentiated by wherein such sets of delineated sexual lines express differences in their flowering responses to various photoperiods and ~~by their start times and durations of female or seed developmental stages relative to development of nongametophytic ovule and ovary tissue~~ such that initiation of embryo sac formation in one of said sets of delineated sexual lines occurs at about the same time or before meiosis in the other of said sets of delineated sexual lines relative to developmental maturity of nongametophytic ovule and ovary tissues; and

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(b) hybridizing said sets of delineated sexual lines, recovering seed from the ~~hybridization~~ hybridizing of the sets of delineated lines, sowing said seed, and selecting diploid hybrid lines that express apomixis.

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Claims 2 (currently amended) The method of claim 1 wherein the ~~differentiation~~ two sets of diploid delineated sexual lines that express differences in flowering responses ~~are occurs within~~ a member of the group consisting of short-day plants, long-day plants, dual-day-length plants, intermediate-day-length plants, ambiphotoperiodic plants, and day-neutral plants.

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Claim 3 (currently amended) The method of claim 1 wherein each of the two sets of diploid delineated sexual lines that express differences ~~differentiation~~ in flowering responses ~~occurs across at least one member of~~ is of a different response type selected from the group consisting of short-day plants, long-day plants, dual-day-length plants, intermediate-day-length plants ambiphotoperiodic plants, and day-neutral plants.

Claim 4 (original) The method of claim 1 wherein the differences in ~~differentiation of~~ flowering responses to various photoperiods ~~is~~ are obtained by plant breeding.

Claims 5-6 (canceled).

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Claim 7 (currently amended) The method of claim 1 wherein
~~differentiation in start times and durations of female or seed~~
~~developmental stages is selected for as a trait in a plant breeding~~
~~step.~~ timing and duration of meiosis and embryo sac formation
relative to developmental maturity of a nongametophytic ovule or
ovary tissue are selected for in a plant breeding step involving
one or both of said two sets of delineated sexual lines.

Claim 8 (original) The method of claim 1 wherein the
nongametophytic ovule and ovary tissues comprise at least one
member of the group consisting of nucellus, integument, pericarp,
hypanthium, and pistil wall.

Claim 9 (previously amended) The method of claim 1 wherein
the hybrid lines comprise ~~genomes~~ genetic material from each set of
delineated lines.

Claim 10 (canceled).

Claim 11 (canceled).

F₇ Claim 12 (currently amended) The method of claim 1 wherein said ~~selected~~ hybrid lines display a reproductive anomaly selected from the group consisting of apospory, diplospory, and polyembryony.

Claims 13-~~16~~ (canceled).

Claim 17 (currently amended) A method for obtaining apomictic plants from sexual plants comprising:

F₈ (a) identifying ~~divergence~~ differences in flowering responses to various photoperiods within ~~a~~ an angiospermous plant species, genus, or family or group of related plant species;

(b) obtaining two sets of diploid lines of said plant species, genus, or family or group of related plant species that wherein said lines differ in ~~are differentiated by~~ their flowering responses to various photoperiods;

(c) identifying ~~divergence~~ differences within and between said sets of lines ~~divergence in start times and durations of female or seed developmental stages relative to development of nongametophytic ovule and ovary tissues~~ such that initiation of embryo sac formation in one of said sets of lines occurs at about the same time or before meiosis in the other of said sets of

delineated sexual lines relative to developmental maturity of
nongametophytic ovule and ovary tissues;

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(d) obtaining two sets of diploid delineated sexual lines of said species, genus, or family ~~or group of related species~~ that differ in ~~are differentiated by~~ their flowering responses to various photoperiods and such that initiation of embryo sac formation in one of said sets of delineated sexual lines occurs at about the same time or before meiosis in the other of said sets of delineated sexual lines relative to developmental maturity of nongametophytic ovule and ovary tissues ~~by their start times and durations of female or seed developmental stages relative to development of nongametophytic ovule and ovary tissues;~~ and

(e) producing diploid hybrid lines that express apomixis by hybridizing said two sets of delineated sexual lines, recovering hybrid seed from the hybridization ~~hybridizing of said two sets of delineated sexual lines~~, sowing said hybrid seed, and selecting said ~~apomictic~~ diploid hybrid lines that express apomixis.

Claim 18 (currently amended): A method for obtaining aposporic, diplosporic, or polyembryonic plants from sexual monocotyledonous or dicotyledonous plants comprising:

(a) identifying divergence differences ~~in flowering responses to various photoperiods~~ days to flowering or photoperiod required

to induce flowering within a an angiospermous plant species, genus, or family or group of related plant species;

(b) obtaining two sets of diploid lines of said plant species, genus, or family or group of related plant species such that said sets of lines are differentiated by differ in their flowering responses to various photoperiods days to flowering or photoperiod required to induce flowering;

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(c) identifying within and between said sets of lines divergence differences in start times and durations of female or seed developmental stages selected from the group consisting of archesporium formation, megasporogenesis, and megametogenesis, and early embryony embryony relative to the development of nongametophytic ovule and ovary tissues selected from the group consisting of nucellus, integument, pericarp, hypanthium, and pistil wall;

(d) obtaining two sets of diploid delineated sexual lines of said species, genus, or family or group of related species such that said sets of delineated sexual lines differ are differentiated by their

(i) by their days to flowering or photoperiod required to induce flowering, responses to various photoperiods such that divergence occurs within a member or across more than one member selected from the group consisting of short-day plants, long-day

~~plants, dual-day-length plants, intermediate-day-length plants, ambiphotoperiodic plants, and day-neutral plants,~~ and

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(ii) such that initiation of embryo sac formation in one of said sets of delineated sexual lines occurs at about the same time or before meiosis in the other of said sets of delineated sexual lines relative to developmental maturity of nongametophytic ovule and ovary tissues ~~start times and durations of female or seed developmental stages selected from the group consisting of archesporium formation, megasporogenesis, megagametogenesis, and early embryony relative to the development of nongametophytic ovule and ovary tissues selected from the group consisting of nucellus, integument, pericarp, hypanthium, and pistil wall such that divergence occurs within one member or spans more than one member of such female developmental stages; and~~

(e) producing progeny by sexual reproduction ~~or somatic cell hybridization~~ of said two sets of diploid delineated sexual lines such that apomixis is expressed in said progeny.

Claims 19-22 (canceled).

Claim 23 (previously amended) The method of claim 18 wherein said producing progeny is by sexual reproduction.

Claims 24-33 (canceled).

Claim 34 (currently amended): A method for producing apomictic plants from ~~two or more~~ sexual plants ~~of the same or related species~~ comprising:

F₉ (a) obtaining two sexual diploid lines, of the same angiospermous species, genus, or family, whose female reproductive phenotypes differ such that under similar environmental conditions initiation of embryo sac formation in one of said sexual lines occurs at about the same time or before meiosis in the other of said sexual lines relative to developmental maturity of nongametophytic ovule and ovary tissues ~~asynchrony in female developmental schedules between the two lines occurs~~; and

(b) hybridizing the two sexual diploid lines by plant breeding ~~or somatic cell hybridization to induce apomixis~~, obtaining diploid progeny from such hybridizing of the two sexual lines, and selecting apomictic plants from among said diploid progeny.

Claim 35 (currently amended): A method for obtaining apomictic plants from sexual plants comprising:

F₁₀ (a) obtaining ~~at least~~ two sets of diploid delineated sexual lines from ~~a~~ an angiospermous plant species, genus, or family or

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~~group of related plant species~~ selected from families that exhibit apomixis in nature, wherein said sets and that differ in are differentiated by their flowering responses to various photoperiods and by their start times and durations of female or seed developmental stages relative to development days to flowering or photoperiod required to induce flowering and such that initiation of embryo sac formation in one of said sets occurs at about the same time or before meiosis in the other of said sets relative to developmental maturity of nongametophytic ovule and ovary tissue; and

(b) hybridizing said sets ~~of delineated sexual lines,~~ recovering seed from the ~~hybridization~~ hybridizing of the sets, sowing said seed, and selecting diploid hybrid lines that express apomixis.

Claim 36 (currently amended): A method for obtaining apomictic plants from sexual plants comprising:

(a) obtaining ~~at least~~ two sets of diploid delineated sexual lines from ~~a~~ an angiospermous plant species or genus ~~group of related plant species~~ selected from the grass family, wherein said sets and that differ in are differentiated by their flowering responses to various photoperiods and by their start times and durations of female or seed developmental stages relative to

development days to flowering or photoperiod required to induce flowering and such that initiation of embryo sac formation in one of said sets occurs at about the same time or before meiosis in the other of said sets relative to developmental maturity of nongametophytic ovule and ovary tissue; and

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C₁₀. (b) hybridizing said sets, recovering seed from the hybridization hybridizing of the sets, sowing said seed, and selecting diploid hybrid lines that express apomixis.

Claim 37 (currently amended): A method for obtaining apomictic plants from sexual plants comprising:

(a) obtaining ~~at least~~ two sets of diploid delineated sexual lines from ~~a~~ an angiospermous plant species or genus ~~group of related plant species~~ selected from the Asteraceae family, wherein said sets and that differ in ~~are differentiated by their flowering responses to various photoperiods and by their start times and durations of female or seed developmental stages relative to~~ development days to flowering or photoperiod required to induce flowering and such that initiation of embryo sac formation in one of said sets occurs at about the same time or before meiosis in the other of said sets relative to developmental maturity of nongametophytic ovule and ovary tissue; and

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(b) hybridizing said sets, recovering seed from the
~~hybridization~~ hybridizing of said sets, sowing said seed, and
selecting diploid hybrid lines that express apomixis.

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Claim 38 (new): The method of claim 2 wherein the
differences in flowering responses are measured in days to
flowering.

Claim 39 (new): The method of claim 1 wherein timing and
duration of meiosis, embryo sac formation, and embryony relative to
developmental maturity of a nongametophytic ovule or ovary tissue
are selected for in plant breeding steps involving one or both of
said two sets of delineated sexual lines.

Claim 40 (new): The method of claim 1 wherein the two sets
of diploid delineated sexual lines that express differences in
flowering responses are long-day plants.

Claim 41 (new): The method of claim 1 wherein the two sets
of diploid delineated sexual lines that express differences in
flowering responses are dual-day-length plants.

Claim 42 (new): The method of claim 1 wherein the two sets of diploid delineated sexual lines that express differences in flowering responses are intermediate-day-length plants.

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Claim 43 (new): The method of claim 1 wherein the two sets of diploid delineated sexual lines that express differences in flowering responses are ambiphotoperiodic plants.

Claim 44 (new): The method of claim 1 wherein the two sets of diploid delineated sexual lines that express differences in flowering responses are day-neutral plants.
